IUCLID 5
Guidance and support

Installation Guide
Distributed version
Linux – Apache Tomcat - PostgreSQL

IUCLID 5

INTERNATIONAL UNIFORM CHEMICAL INFORMATION DATABASE

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1. Introduction

IUCLID 5 has two different installation architectures:

- Standalone installation

  The IUCLID5 application connects directly to the database which usually resides on the same computer. Using this installation not more than one user can work simultaneously on the same database.

- Distributed installation

  In this architecture the database and the application server resides on a server computer and the user works at another computer called client. It is similar to a web based application with the only difference that the user interface of the application (buttons, text boxes etc.) is not a series of web pages but specific java application called "IUCLID5 client" downloaded automatically from the server.

This document describes how to download, install and configure the necessary open source software products and the IUCLID5 application itself on a Linux server. Only the distributed

installation is described.

The aim of this document is that a user with computer skills would be able to install and run IUCLID5. The following is a list of items NOT covered in this document:

- Complete and detailed installation and configuration procedure of the operating system (GNU/Linux).

- In detail configuration of the Database Management System (PostgreSQL) and the Application Server (Tomcat)

- Update of any component of the system if a previous version is installed

- Repairing of a not working or partially installed PostgreSQL or Tomcat

2. Conventions of this document

All the commands required to install IUCLID5 have to be entered into the shell console which is a text mode screen. The graphical user interface is not required. In this mode the system writes on the screen a short text called prompt when the previous command is finished and the system is ready to exexute another command. The prompt is different on each computer. It might provide information about the computer's name, the currently logged in user, the current directory etc. This document uses the current directory name followed by the # sign to represent the prompt. The ~ sign means the home directory (/root).

```
~#
```

The command you have to enter is printed with bold characters. You must write the commands *exactly* as written, upper and lowercase does matter. At the end of a command you have to press the **enter** key.

```
~#command
output
~#
```

In many cases the commands do not give any output on the screen. Nevertheless some commands write the output on the screen. For example the **ls** command lists the content of a directory.

If an error message appears read it carefully and try to correct the problem. For example if the **cp** (copy) command cannot find the required file, it reports the error.

```
~#cp iuclid5 root
cp: cannot stat 'iuclid5': No such file or directory
~#
```

3. Prerequisites

3.1. Hardware requirements

The server hosting IUCLID 5 must have at least:

- RAM: 512 MB (recommended 1 GB)

- Hard disk space: 200 GB
- CPU: 2 GHz, 32 or 64 bit architecture
- Network adapter 100 Mbps (recommended 1Gbps)

4. Download

Before you start the installation procedure you have to download all the required components for IUCLID5. For security reasons it is not recommended to use the server for download from the internet. Use another computer for this task and copy the files to the server.

The required components are the JAVA Development Kit, PostgreSQL database management system, Tomcat servlet container and the IUCLID5 server web archive (i5server.war).

Create a new directory `iuclid5` and store there all the downloaded files.

In order to select the correct files, you should know the architecture (platform) of your server computer. Please consult the user manual of your computer. If the Linux operating system is already installed, write the following command. The command will write the platform's name on the screen, for example `i386`.

```
~#uname -i
i386
~#
```

Note: IUCLID5 was tested only on the i386 and x86_64 architecture. IUCLID5 might work on a different server but will require other components and installation procedure which is not covered in this document.

4.1. JAVA Development Kit

Go to the website http://java.sun.com/javase/downloads/index.jsp and download the appropriate JAVA Development Kit (JDK) 6 version. Select the latest update. Note that the JAVA Runtime Environment (JRE) is not sufficient for IUCLID5. The installation script requires the RPM distribution in self-extracting file.

For example for a 32 bit computer download the `i586` version.

```
jdk-6u1-linux-i586-rpm.bin
```

If you have a computer with 64 bit processor(s) and the 64 bit version of Linux installed on it then download the 64 bit java SDK.

```
jdk-6u1-linux-amd64-rpm.bin
```

4.2. PostgreSQL

You can find the installation packages on http://www.postgresql.org. The required version is 8.2.x where x is the highest available number. In the download section click on FTP Browser ad navigate to:

```
Top → binary → v8.2.x → linux → rpms → redhat → rhel-es-4
```

If you have 64 bit operating system choose the `rhel-es-4-x86_64` directory.

You do not need to download all the installation packages. Only the files with the name starting with `postgresql-libs-`, `postgresql-server` and `postgresql-` followed by the version, the computers architecture and the `.rpm` extension are required.

For example to install the version 8.2.3 on an i686 computer you have to download the following files:

```
postgresql-libs-8.2.3-1PGDG.i686.rpm
postgresql-8.2.3-1PGDG.i686.rpm
postgresql-server-8.2.3-1PGDG.i686.rpm
```

4.3. Apache Tomcat

You can find the installation packages and documentation on http://tomcat.apache.org. In the download area of Tomcat 5.5 (http://tomcat.apache.org/download-55.cgi) amongst several packages select the binary `core` package in `tar.gz` format. The required version is 5.5.x where x is the highest available number.

The file to download is for example:

```
apache-tomcat-5.5.23.tar.gz
```

4.4. IUCLID5

Before downloading IUCLID5 you need to register as a IUCLID user on the website http://iuclid.eu. The application itself is the `i5server.war` file. In addition, you need to get the `install` script, which is the installation program and an `extras.zip` file containing additional components.

Having downloaded all the required components described above in this document, now your `iuclid5` directory contains the following files:

```
jdk-6-linux-i586-rpm.bin
postgresql-libs-8.2.3-1PGDG.i686.rpm
postgresql-8.2.3-1PGDG.i686.rpm
postgresql-server-8.2.3-1PGDG.i686.rpm
apache-tomcat-5.5.23.tar.gz
i5server.war
install
extras.zip
```

Please note that the version and the architecture may be different in your case.

5. Operating System Installation

This document is based on the CentOS 4.4 and 5, RedHat Enterprise Server 4 and 5 distribution of linux. The two distributions are compatible; the IUCLID5 installation procedure is the same on both systems. If you are using another distribution the installation script might not work.

CentOS is an Enterprise-class Linux Distribution derived from sources freely provided to the public

by a Linux vendor. You can download it from http://www.centos.org. It is sufficient to download the `server-cd` because IUCLID5 server requires only the minimal operating system installation without any optional software.

Redhat ES-4 is a commercial product. For more information look at http://www.redhat.com.

It is recommended to select the minimum configuration when the installation program asks to select the software components to be installed. You may want to install the applications you need, but keep in mind that it is not a good practice to install not necessary software on the server.

You should not install the PostgreSQL at this stage because it contains an older version which is not compatible with IUCLID5.

5.1. Enabling the network for IUCLID5 server

In order of establish the connection from the workstation computer to the server, the server's firewall must be configured to allow the IUCLID5 server to accept connections.

It is not recommended to completely disable the firewall. The `system-config-securitylevel-tui` tool allows you to easily modify the firewall settings.

```
~#system-config-securitylevel-tui
```

Figure 3.1. Firewall configuration - main screen

On the main screen use the TAB key to highlight the "Customize" button and press the SPACE bar.

Be cautious! You should not trust any network interface. In the "Allow incoming" section set SSH

(secure shell) and 8080 port. For security reasons do not allow any other traffic like telnet, http or ftp.

Figure 3.2. Firewall configuration - Customize
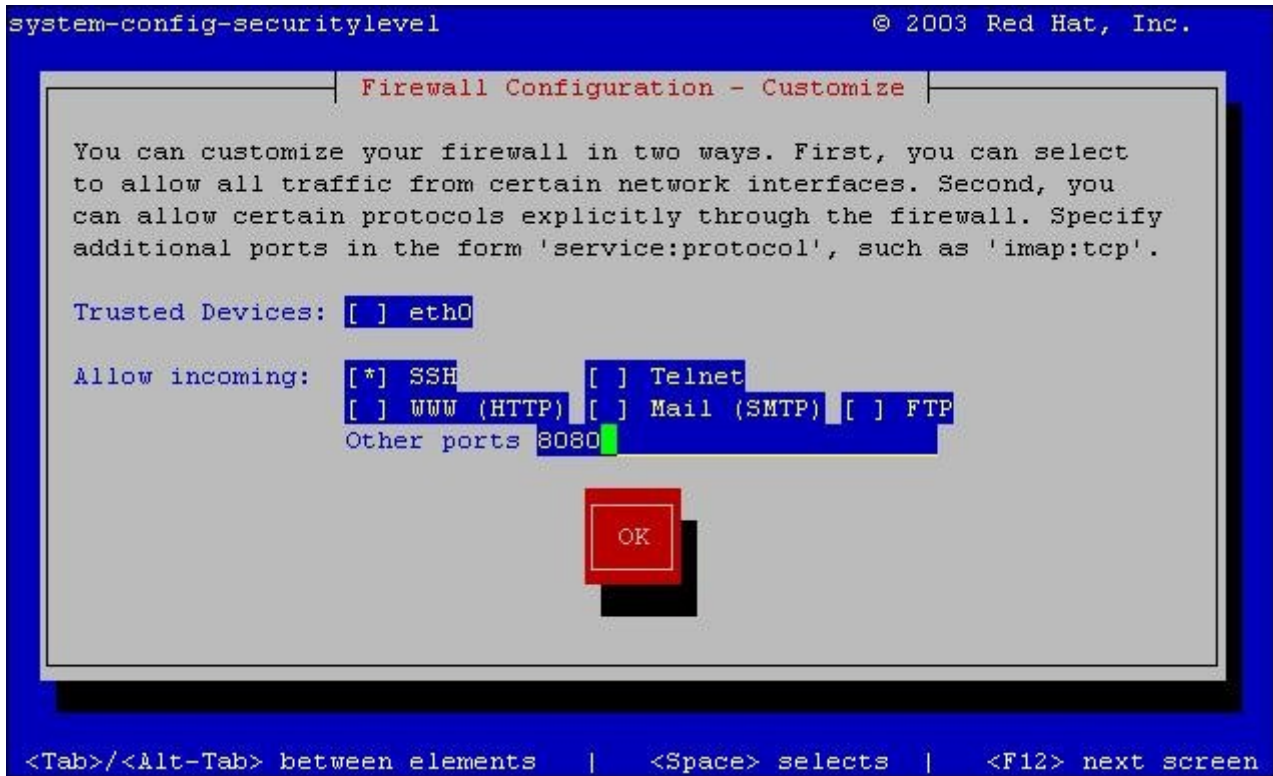
Complete the process by selecting OK and OK again on the main screen.

Your Linux operating system is now ready to install IUCLID5.

6. Transfer the installation packages onto the hard disk of the server.

You can use either CD-ROM or a removable USB storage device.

6.1.Copy from CD-ROM

Burn the directory `iuclid5` on a CD using your preferred CD writer application.

Log in using the root user account and insert the CD into the driver of your Linux server.

In order to find the location of your CD-drive in the filesystem, list the content of the `/media` directory. You should find in the list items such as `cdrom` or `cdrecorder`. If you have a CD writer then you will see `/cdrecorder` in the list. In this case you have to use this directory instead of `cdrom` in the following commands.

```
~#ls /media
cdrom floppy
~#
```

Before you can copy the files from the CD you have to mount it (connect to the linux file system).

```
~#mount /media/cdrom
mount: block device /dev/hdc is write-protected, mounting read-only
~#
```

The full content of your CD is accessible in the directory /media/cdrom.

```
~#ls /media/cdrom
/iuclid5
~#
```

Before starting the installation it is necessary to copy all the required packages into the hard disk.

```
~#cp -r /media/cdrom/iuclid5 /root/
~#
```

Everything you need is in the /root/iuclid5 directory, you can start the installation.

Before removing the CD from the drive it is necessary to release it with the command umount.

```
~#umount /media/cdrom
~#
```

6.2. Copy with removable USB storage device

Plug your USB memory stick into a free USB socket of your computer. The system recognizes the new hardware and creates a new directory in /media. List the content of this directory and you will see your device; in this example the name is usbmem, it might be different in your case.

```
~#ls /media
/floppy /cdrom /usbmem
~#
```

> **Note**
> CentOS5 and Red Hat EL5 might not create the directory in /media. In that case consult the manual of the mount command.

Now proceed exactly as copying from a CD-ROM with the difference that you use your usbmem name instead of cdrom or cdrecorder. For example:

```
~#mount /media/usbmem/
~#cp -r /media/usbmem/iuclid5 /root/
~#umount /media/usbmem/
```

7. Quick Start

Having followed the previous steps you have now a new and functioning Linux operating system and all the necessary files for IUCLID5 installation. Change the current working directory to iuclid5.

```
~#cd iuclid5
```

```
iuclid5#
```

Make the `install` script executable with the **chmod** command.

```
iuclid5#chmod +x install
iuclid5#
```

Start the installation process by writing the **./install** command.

> **Note**
>
> Start the comman with ./.

```
iuclid5#./install
iuclid5#
```

Messages are displayed on the screen as the program proceeds and each line is closed by a **green OK**, which means successful completion of the task. At the end of the process a list of addresses are displayed, which you can note and use for connecting to the server from another computer and start using IUCLID5.

```
...
Congratulations!
You have successfully installed IUCLID5 server.
To start to use it by pointing your browser on one of the following addresses
depending on your network configuration.
http://192.168.20.148:8080/i5server
http://www.example.com:8080/i5server
iuclid5#
```

The installation of the IUCLID5 application on the server is completed. No more tasks are required on the sever. Close the session with the logout command.

```
~#logout
```

If the installation program encounters a problem, a red FAILED message is written on the screen and the process stops. In this case you have to examine the previous error message and take appropriate action to resolve the problem. The `/root/iuclid5install.log` file contains detailed information about the previously completed tasks and the error encountered.

8. Step-by-step installation

If you installed IUCLID5 as described in the previous section then you can skip this section.

8.1. JAVA Development Kit

Make the JDK file executable and start it.

```
iuclid5#chmod +x jdk-6-linux-i586-rpm.bin
iuclid5#./jdk-6-linux-i586-rpm.bin
```

The Sun binary code License Agreement prompt is displayed. Press the enter button to scroll down to the end. You are asked to accept the license. Answer yes.

```
Do you agree to the above license terms? [yes or no]
yes
```

Status messages are displayed as the installation process proceeds. Warning messages can be ignored. After the installation check the java environment by displaying the version.

```
iuclid5#java -version
java version "1.6.0"
Java(TM) SE Runtime Environment (build 1.6.0-b105)
Java HotSpot(TM) Server VM (build 1.6.0-b105, mixed mode)
```

> **Note**
>
> Should you encounter the situation when rpm says "package jdk-1.6.0-fcs is already installed" but actually it is not then you can force the installation with the command **rpm -i --force jdk-6-linux-*.rpm.**

For more information please consult the Java SE 6 Platform installation instructions at http://java.sun.com/javase/6/webnotes/install/index.html.

8.2. PostgreSQL

PostgreSQL is the database management system (DBMS) used by IUCLID5 to store all data.

8.2.1. Installing PostgreSQL database management system

Change the current directory to the one containing the postgresql installation packages (`iuclid5`).

```
~#cd iuclid5
iuclid5#
```

Executing the following command you can see which version of postgresql is installed.

```
iuclid5#rpm -qa | grep postgresql
postgresql-8.2.0-2PGDG
postgresql-libs-8.2.0-2PGDG
postgresql-server-8.2.0-2PGDG
iuclid5#
```

The next step is determined by the output of the previous command.

- The version 8.2.x or later is installed, you can proceed with creating a new database in the next section.

- An older version of PostgreSQL is installed must uninstall it (the -e option means erase).

- Empty result: PostgreSQL is not installed, you can proceed with the installation

How to uninstall PostgreSQL.

> **Warning**
> Do not forget to back up your data before uninstalling the database system!

```
iuclid5#rpm -e postgresql postgresql-libs postgresql-server
iuclid5#rpm -qa | grep postgresql
```

```
iuclid5#
```

Install the tree packages of PostgreSQL in one step using the `rpm` command.

> **Note**
> Use the actual file names which are in your directory (version number and platform might be different). Long commands can be splitted into two or more lines typing the '\' character followed by ENTER. (the -i option means install and v means verbose).

```
iuclid5#rpm -iv postgresql-libs-8.2.0-2PGDG.i686.rpm \
>postgresql-8.2.0-2PGDG.i686.rpm postgresql-server-8.2.0-2PGDG.i686.rpm
Preparing packages for installation...
postgresql-libs-8.2.0-2PGDG
postgresql-8.2.0-2PGDG
postgresql-server-8.2.0-2PGDG
iuclid5#
```

Now the database server is installed. Before you can do anything, you must initialise a database storage area on disk using initdb. It consists of creating a set of files in a directory called "Data area" which is by default the `/var/lib/pgsql/data/` directory.

```
iuclid5#service postgresql initdb
Initializing database:                                  [  OK  ]
iuclid5#
```

> **Note**
> If the "Data directory is not empty!" message is displayed, it means you have already initialized the data area. You can decide whether to delete the content of the old data directory or keep it. You can keep it only if it was created by the same version of PostgreSQL.
>
> ```
> iuclid5#rm -r -f /var/lib/pgsql/data/
> iuclid5#
> ```
>
> After deleting the old data execute the service postgresql initdb command again to recreate the data directory.

Your database management system is ready to start.

```
iuclid5#service postgresql start
Starting postgresql service:                            [  OK  ]
iuclid5#
```

With the previous command you started the server manually. You may want that PostgreSQL starts automatically when you switch on the computer. The chkconfig command is used to tell to the system what to start at system startup without manual intervention.

```
iuclid5#chkconfig --level 345 postgresql on
iuclid5#
```

8.2.2. Creating the IUCLID5 database

The installation process a new user "postgres" has been created. The "postgres" user has no

password so you can not log in using this username. Its purpose is performing database administrative tasks. To act as postgres user you have to use the **su** command.

Change the current directory and current user.

```
iuclid5#cd /
/#su postgres
$
```

> **Note**
> Changing the user the prompt is also changed to the $ sign (and usually "bash-3.00$" is displayed).

Now each command you type is executed as postgres user. The first thing to do is creating a database user that allows IUCLID5 application to connect to the database. Type a password, confirm the password and answer "n" to all subsequent questions. (Press enter after each answer).

> **Note**
> Remember the password you give to iuclid5 user, it will be needed later.

```
$createuser -EP iuclid5
Enter password for new role:
Enter it again:
Shall the new role be a superuser? (y/n) n
Shall the new role be allowed to create databases? (y/n) n
Shall the new role be allowed to create more new roles? (y/n) n
CREATE ROLE
$
```

Create new database specifying the owner, encoding and the name of the database.

```
$createdb --owner=iuclid5 --encoding=UTF-8 iuclid5
CREATE DATABASE
$
```

Finished the database preparation tasks change back the root user.

```
$exit
/#
```

For security reasons by default database users are not enabled to connect to the database even if they provide the correct password. It is necessary to configure PostgreSQL in order to enable IUCLID5 to connect.

Open the file using a text editor for example **nano**.

```
iuclid5#nano /var/lib/pgsql/data/pg_hba.conf
# PostgreSQL Client Authentication Configuration File
# ===================================================
#
```

Move the cursor to the end of the file using the down arrow button until the line "# IPv4 local connections:".

```
# IPv4 local connections:
```

```
host      all          all          127.0.0.1/32          ident sameuser
```

Insert a new line just after the "IPv4 local connections" and type "host iuclid5 iuclid5 127.0.0.1/32 md5". This line tells PostgreSQL that the iuclid5 user is allowed to connect to iuclid5 database from the local computer using the encrypted password authentication.

```
# IPv4 local connections:
host      iuclid5      iuclid5      127.0.0.1/32          md5
host      all          all          127.0.0.1/32          ident sameuser
```

Press CONTROL-X to exit from the editor, type "y" to save the file and confirm the file name with by pressing the enter key.

```
Save modified buffer (ANSWERING "No" WILL DESTROY CHANGES) ? y
 Y Yes
 N No              ^C Cancel


File Name to Write: /var/lib/pgsql/data/pg_hba.conf
^G Get Help         M-D DOS Format      M-A Append          M-B Backup File
^T To Files         M-O Mac Format      M-P Prepend         ^C Cancel
```

Notify the server that the configuration has been changed using the service command.

```
/#service postgresql reload
```

Your IUCLID5 database is now ready to serve the IUCLID5 application.

For more information about installing PostgreSQL and administer the server look for the http://www.postgresql.org/docs/ documentation page.

8.2.3. Set up daily backup of the database

The data you store into IUCLID 5 might be very important for your organisation. A malicious user or a regular user might accidentally delete valuable data or a system failure cause loss of data. To prevent this situation and prepare a smooth recovery, it is vital to schedule a daily backup.

Change the current directory to iuclid5.

```
/#cd /root/iuclid5
iuclid5#
```

Extract the into the cron.daily directory.

```
iuclid5#unzip extras.zip i5backup -d /etc/cron.daily
iuclid5#chmod +x /etc/cron.daily/i5backup
```

The i5backup script every night generates a full database backup and deletes the old ones. In the directory /var/lib/pgsql/backups will be stored the last 3 backups.

> **Warning**
> The system administrator should change the destination of the backup to a network
> drive or a removable device. By default the daily backup files are stored in the same
> hard disk where the database is. In case of disk failure you would lost your backup files

as well. Moreover the restore operation should also be tested in order to ensure the backup is usable in case it is needed.

8.3.Tomcat

Installing Tomcat consists of extracting a set of files and setting up the starting parameters.

Change the current directory to iuclid5.

```
~#cd /root/iuclid5
iuclid5#
```

Extract the downloaded archive into the directory /opt (use the version number of your downloaded Tomcat).

```
iuclid5#tar -xzf apache-tomcat-5.5.23.tar.gz -C /opt
iuclid5#
```

Create a version independent symbolic link pointing to the actual tomcat directory. It will be used to find the location of Tomcat, whichever version is installed.

```
iuclid5#ln -s apache-tomcat-5.5.23 /opt/apache-tomcat"
iuclid5#
```

> **Note**
> Tomcat contains some example applications which are not needed. You can delete them in order to save resources. Do not delete the ROOT directory!
>
> ```
> iuclid5#rm -rf /opt/apache-tomcat/webapps/balancer
> iuclid5#rm -rf /opt/apache-tomcat/webapps/jsp-examples
> iuclid5#rm -rf /opt/apache-tomcat/webapps/servlets-examples
> iuclid5#rm -rf /opt/apache-tomcat/webapps/webdav
> ```

Tomcat writes a log file which serves valuable information to the system administrator in case of problems. The system used to write the log files is log4j. The same component is used and distributed with IUCLID5. Extract the files from i5server.war which is actually a zip file.

```
iuclid5#unzip -j i5server.war WEB-INF/lib/commons-logging.jar \
>-d /opt/apache-tomcat/common/lib/
Archive:  i5server.war
  inflating: /opt/apache-tomcat/common/lib/commons-logging.jar
iuclid5#unzip -j i5server.war WEB-INF/lib/log4j.jar \
>-d /opt/apache-tomcat/common/lib/
Archive:  i5server.war
  inflating: /opt/apache-tomcat/common/lib/log4j.jar
iuclid5#
```

Log4j also need to be configured. A default configuration file is included in extras.zip. Extract it into the /common/classes/ directory of Tomcat.

```
iuclid5#unzip extras.zip log4j.properties \
>-d /opt/apache-tomcat/common/classes/
Archive:  extras.zip
  inflating: /opt/apache-tomcat/common/classes/log4j.properties
```

```
iuclid5#
```

In order to start tomcat automatically at system startup you need to add a small executable program to tomcat. Extract the `jsvc` program into the `bin/` directory of apache and make it executable.

> **Note**
> Select the i386 or the x86_64 according to your platform.

```
iuclid5#unzip -j extras.zip i386/jsvc -d /opt/apache-tomcat/bin
Archive:  extras.zip
  inflating: /opt/apache-tomcat/bin/jsvc
iuclid5#chmod +x /opt/apache-tomcat/bin/jsvc
iuclid5#
```

The startup script of Tomcat (called `tomcat`) has to be in the directory `/etc/init.d/` and made executable.

```
iuclid5#unzip extras.zip tomcat -d /etc/init.d
Archive:  extras.zip
  inflating: /etc/init.d/tomcat
iuclid5#chmod +rx /etc/init.d/tomcat
iuclid5#
```

The chkconfig command can be used to activate and deactivate services. Set tomcat to start automatically using the following commands.

```
iuclid5#chkconfig --add tomcat
iuclid5#chkconfig --level 345 tomcat on
iuclid5#
```

For security reasons it is not recommended to run a service with root privileges. Create a tomcat user.

```
iuclid5#useradd -c Apache_Tomcat_Servlet -s /sbin/nologin \
>-d /opt/apache-tomcat tomcat
iuclid5#
```

Give ownership of the `/opt/apache-tomcat/` directory to tomcat user.

> **Note**
> With this command use the complete directory name with version number.

```
iuclid5#chown -R tomcat:tomcat /opt/apache-tomcat-5.5.23
iuclid5#
```

Now Tomcat is ready to start.

```
iuclid5#service tomcat start
Starting Tomcat - IUCLID5 server                         [  OK  ]
iuclid5#
```

For more information visit the http://tomcat.apache.org/ website.

8.4. IUCLID5

8.4.1. Deployment on Tomcat

Deployment is the term used for the process of installing a web application into the Tomcat server.

Web application deployment may be accomplished in a two ways.

- Statically - the web application is setup before Tomcat is started
- Dynamically - in conjunction with the Tomcat Manager web application or manipulating already deployed web applications

You can find more information about how to deploy a web application on tomcat on the http://tomcat.apache.org/tomcat-5.5-doc/deployer-howto.html web page.

In this document only the Static deployment is described. However also the dynamic deployment may be used.

Tomcat has to be stopped using the command `service`.

```
~#service tomcat stop
```

The deployment of IUCLID5 actually consists of extracting the `i5server.war` archive into the `webapps` directory of Tomcat.

```
iuclid5#unzip i5server.war -d /opt/apache-tomcat/webapps/i5server
Archive:  i5server.war
...
  inflating: /opt/apache-tomcat/webapps/i5server/WEB-INF/web.xml
iuclid5#
```

Extract the default `server.properties` file into the `/opt/apache-tomcat/webapps/i5server/WEB-INF/classes` directory.

```
iuclid5#unzip extras.zip server.properties \
>-d /opt/apache-tomcat/webapps/i5server/WEB-INF/classes
Archive:  extras.zip
  inflating: /opt/apache-tomcat/webapps/i5server/WEB-
INF/classes/server.properties
iuclid5#
```

The `server.properties` file is the configuration of IUCLID5 server. In order to connect to the database correctly it is necessary to modify the `server.properties` configuration file. The default configuration file contains settings for connect to a PostgreSQL database on the same computer. Usually it is sufficient to specify the database password.

```
#
# Settings for using PostgreSQL
#
hibernate.connection.url=jdbc:postgresql://localhost:5432/iuclid5
hibernate.connection.username=iuclid5
hibernate.connection.password=MUST_CHANGE_THE_PASSWORD
hibernate.connection.driver_class=org.postgresql.Driver
hibernate.dialect=org.hibernate.dialect.PostgreSQLDialect
```

If your database server is running on another computer or database name, username are different, modify the settings accordingly. For example your database server's name is dbserver, PostgreSQL is accepting connections on port 12345, the database name is chemdb and the user is joe with password xxxx, then your configuration is:

```
hibernate.connection.url=jdbc:postgresql://dbserver:12345/chemdb
hibernate.connection.username=joe
hibernate.connection.password=xxxx
```

Iucid5 server creates a file `iuclid5server.log` and registers activities that help the system administrator. By default this file is created in the root folder and ever growing. In order to change this it is necessary to configure the logging system by copying the configuration file into the classes directory.

```
iuclid5#unzip extras.zip i5server.logging.properties \
>-d /opt/apache-tomcat/webapps/i5server/WEB-INF/classes
Archive:  extras.zip
  inflating: /opt/apache-tomcat/webapps/i5server/WEB-INF/classes/
i5server.logging.properties
iuclid5#
```

The logging system creates each day a new log file adding the date suffix to the file name. The old log files are not needed so in order to prevent filling the hard drive they have to be deleted regularly. The safest way to do it is scheduling a task which is executed by the system every day. The `i5logrotate` script deletes log files older than 30 days in the logs directory of Tomcat.

```
iuclid5#unzip extras.zip i5logrotate -d /etc/cron.daily
Archive:  extras.zip
  inflating: /etc/cron.daily/i5logrotate
iuclid5#chmod +x /etc/cron.daily/i5logrotate
iuclid5#
```

Start Tomcat usig the `service` command.

> **Note**
> When IUCLID5 is started the first time it creates new tables in the database which might take up to 30 seconds.

```
iuclid5#service tomcat start
Starting Tomcat - IUCLID5 server                            [  OK  ]
iuclid5#
```

The installation is completed. You can connect to the application with your browser by typing the address http://your_server:8080/i5server

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